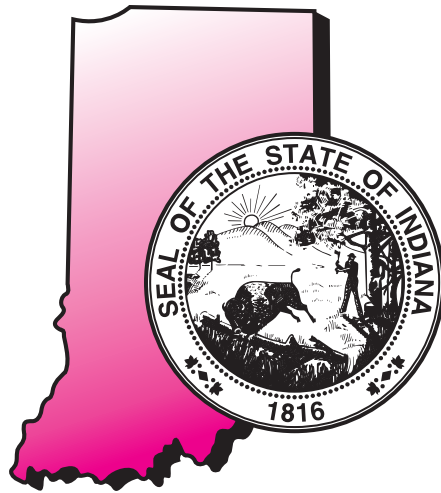


# ***ISTEP+* Spring 2008**

Indiana Statewide Testing for Educational Progress

## **Graduation Qualifying Exam Retest Applied Skills Assessment Mathematics**



Indiana Department of Education

Web Version



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***ISTEP+*** Spring 2008  
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Graduation Qualifying Exam Retest  
**Applied Skills Assessment**  
Mathematics

Use only a Number 2 pencil to respond to the questions in this book. Responses written in pen CANNOT be scored.



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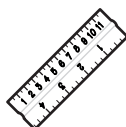
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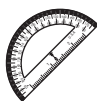
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This symbol appears at the beginning of the sections that contain gridded-response problems.



If you see this symbol, use your ruler as a straightedge or to solve the problem.



If you see this symbol, use your protractor to solve the problem.

# Test 1: Mathematics



Since you may receive partial credit for many of the problems, it is important to show ALL work in the spaces provided in this book. When you see the words **Show All Work**, be sure to

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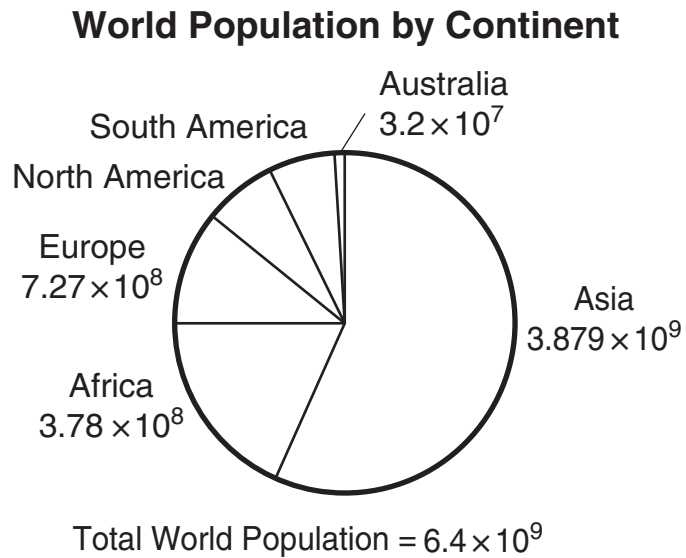
- 1 Jamie is saving money to buy a CD player that will cost \$58, including tax. She has already saved \$16. She can earn \$6 per hour doing yard work. How many hours will Jamie need to work to earn enough money to buy the CD player?

**Show All Work**

**Answer** \_\_\_\_\_ hours

**Go On** 

2 Consider the circle graph below.



What is the total population of North America and South America?

**Show All Work**

**Answer** \_\_\_\_\_

Go On 

- 3 On the line below, write the slope-intercept form of  $4y + x = -9$ .



Equation \_\_\_\_\_

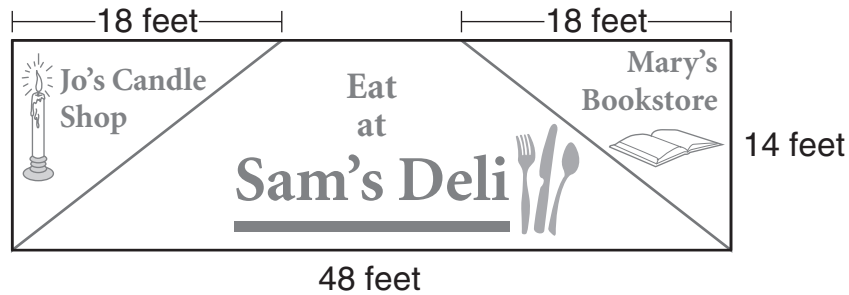
What are the slope and  $y$ -intercept of the equation?

Answer slope \_\_\_\_\_,  $y$ -intercept \_\_\_\_\_

Go On 

4

Sam's Deli shares advertising space on a rectangular billboard with two other stores. A diagram of the billboard is shown below.



What is the area of the billboard, in square feet, covered with Sam's advertisement?

**Show All Work**

**Answer** \_\_\_\_\_ square feet

Go On

- 5** Lee and Dave are buying plants for landscaping. Lee bought 2 hostas ( $h$ ) and 3 marigolds ( $m$ ) for \$43.00. Dave bought 4 hostas and 5 marigolds for \$80.00.

On the lines below, write a system of equations that represents this information.

Equations \_\_\_\_\_

\_\_\_\_\_

Use this system of equations to determine the cost of 1 hosta and the cost of 1 marigold. Write the answers on the lines below.

**Show All Work**

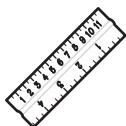
Hosta \$ \_\_\_\_\_

Marigold \$ \_\_\_\_\_

Go On 

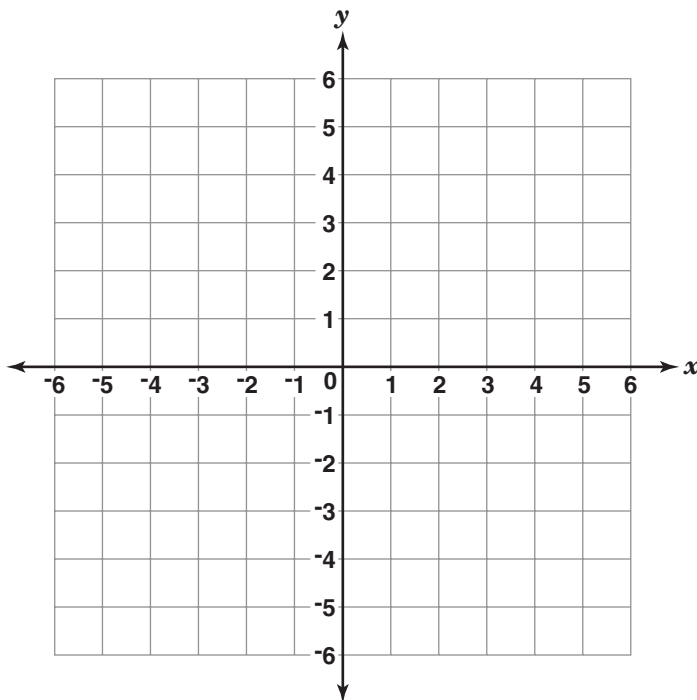
# Test 1

6



Use your ruler as a straightedge.

Graph the equation  $y = -\frac{1}{2}x - 3$  on the coordinate plane below.



- 7** Jenni is having her book printed. A printing company charges \$7.50 per copy, plus a one-time fee of \$125.00 to do the work.

On the line below, write an equation that can be used to determine the total cost,  $y$ , to print  $x$  copies of the book.

**Equation** \_\_\_\_\_

Now use the equation you wrote to determine how many copies of the book Jenni can have printed for \$800.

**Answer** \_\_\_\_\_ copies

Go On 

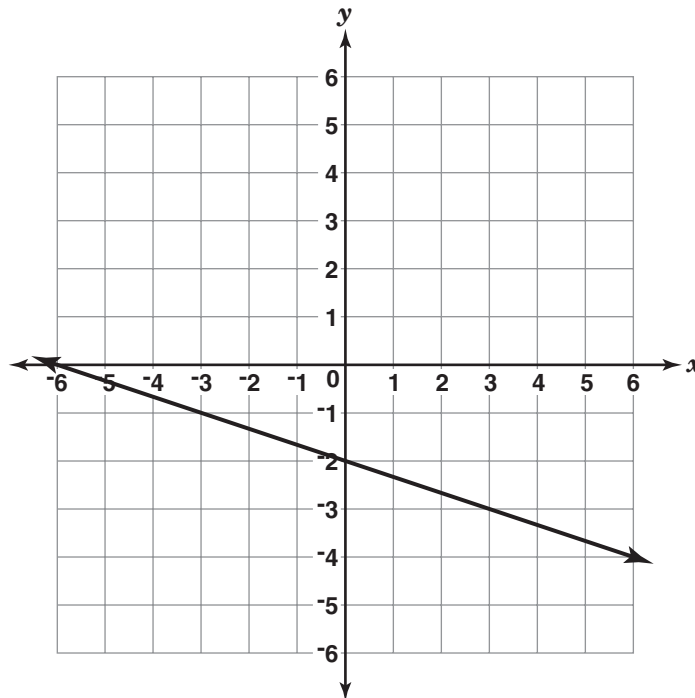
# Test 1

8



A machine at a machine shop is set to cut along the path shown on the coordinate plane below. Terry must change the path by rotating the original path  $90^\circ$  counterclockwise about the origin.

On the coordinate plane below, draw the NEW path the machine is set to cut.



To start the machine Terry must enter the equation of the new line into the machine.

Write an equation of the line that represents the new path the machine will cut.

Equation \_\_\_\_\_



STOP! — STOP! — STOP! — STOP! — STOP! —

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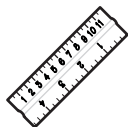
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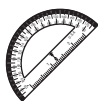
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# Test 2: Mathematics

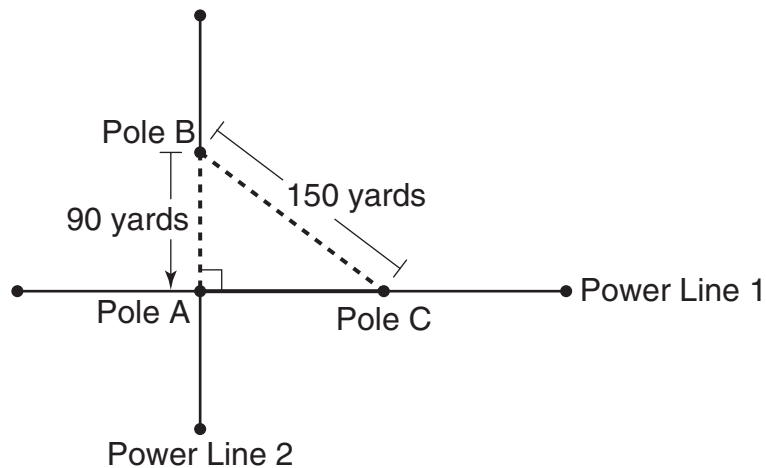


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- show all the steps needed to solve the problem
- make your handwriting clear and easy to read
- write the answer on the answer line

1

A land surveyor wants to know the distance between pole A and pole C in the diagram below.



The surveyor knows that power line 1 is perpendicular to power line 2. What is the distance, in yards, between pole A and pole C? Write your answer on the line below.

**Show All Work**

Answer \_\_\_\_\_ yards

Go On

- 2** Daniel collects \$87.00 by selling paperback books for \$0.50 each and hardcover books for \$4.00 each.

Let  $p$  be the number of paperback books he sells and  $h$  be the number of hardcover books he sells.

Write an equation to represent this situation.

**Equation** \_\_\_\_\_

If Daniel sells 62 paperback books, how many hardcover books does he sell?

**Answer** \_\_\_\_\_ hardcover books

3



Kramer's Cereal Company has been receiving complaints because a cereal box the company makes is too tall for many shelves. The size of the box is 18 inches high, 7.75 inches long, and 2.5 inches wide.

Mr. Kramer decides to keep the same volume and length, but reduce the height of the cereal box by 25%.

What will be the width, in inches, of the new cereal box? Round your answer to the nearest hundredth of an inch.

**Show All Work**

**Answer** \_\_\_\_\_ inches

**Go On** 

4



Jeff's airplane flight was 2,530 kilometers long. The total travel time was 7 hours and 10 minutes, which included a 1 hour and 25 minute stop at an airport.

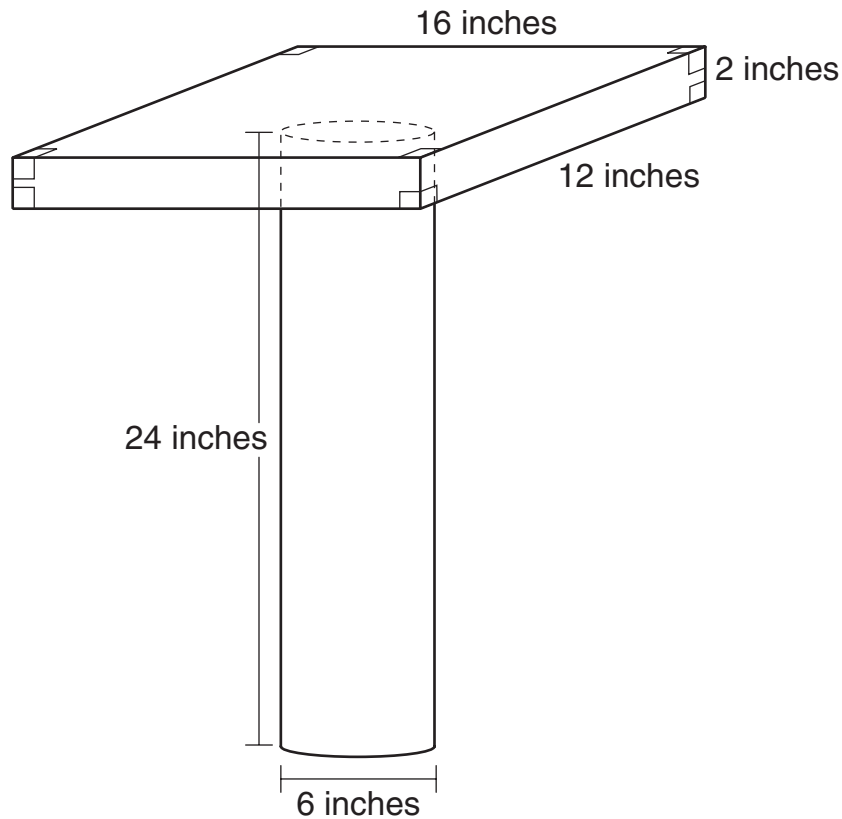
What was the average speed, in KILOMETERS PER HOUR, of the airplane while it was in the air?

**Show All Work**

**Answer** \_\_\_\_\_ kilometers per hour

5

A cement plant stand in the shape of a rectangular prism on top of a cylinder is shown in the diagram below.



What is the volume, in cubic inches, of the plant stand?

**Show All Work**

**Answer** \_\_\_\_\_ cubic inches

**Go On**

6

The fastest whale can swim  $1.878 \times 10^6$  centimeters in 20 minutes. The fastest dolphin can swim  $1.502 \times 10^6$  centimeters in 20 minutes.

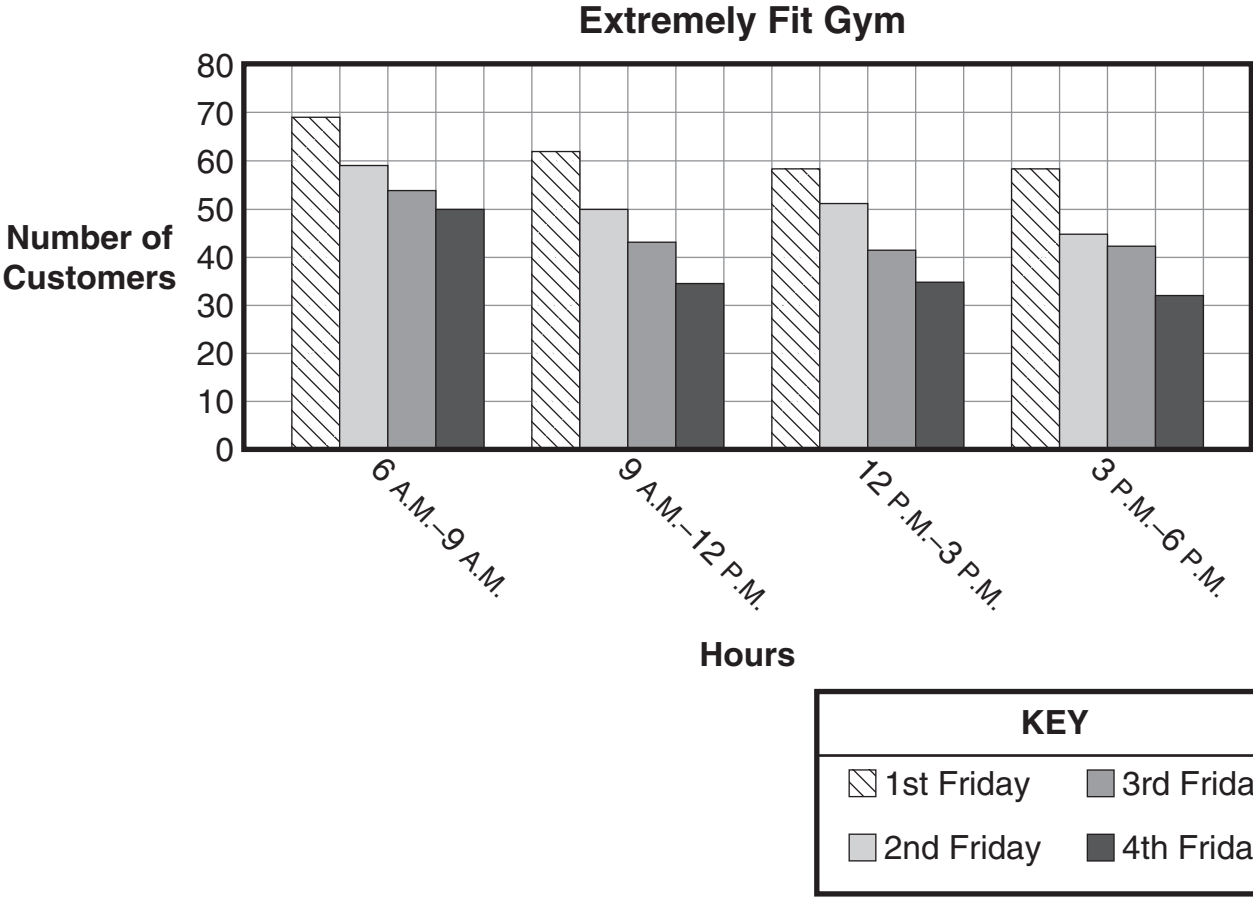


At these speeds, how many more METERS can the fastest whale swim than the fastest dolphin in 1 hour and 15 minutes?

**Show All Work**

**Answer** \_\_\_\_\_ meters

7 The graph below shows the number of customers who exercised at Extremely Fit Gym during different times of the day every Friday in October.



According to the graph, what time period of the day did the greatest number of customers exercise at the gym?

Answer \_\_\_\_\_

On the lines below, describe the trend that occurred from the first Friday to the fourth Friday during the month of October.

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Go On ➡

8



Rubin's car gets 25 miles per gallon. He drove 75 minutes to his aunt's house. When Rubin returned home, he took a different route that took 15 minutes longer. He drove at an average rate of 60 miles per hour both going and returning.

How many MORE gallons of gasoline did Rubin use returning home than driving to his aunt's house? Use the formula below to help determine your answer.

$$\text{Miles per gallon} = \frac{\text{Distance traveled}}{\text{Number of gallons}}$$

**Show All Work**

**Answer** \_\_\_\_\_ gallons



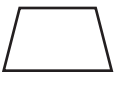


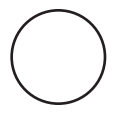
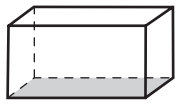
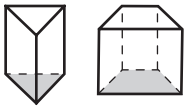

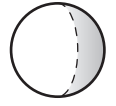




**ATTENTION!** Please do not leave your punchouts in this book.

**STOP! — STOP! — STOP! — STOP! — STOP! —**



# ISTEP+ Grade 9 and GQE Mathematics Reference Sheet

Shape		Formulas for Area (A) and Circumference (C)	
Triangle		$A = \frac{1}{2}bh = \frac{1}{2} \times \text{base} \times \text{height}$	
Rectangle		$A = lw = \text{length} \times \text{width}$	
Trapezoid		$A = \frac{1}{2}(b_1 + b_2) \times h = \frac{1}{2} \times \text{sum of bases} \times \text{height}$	
Parallelogram		$A = bh = \text{base} \times \text{height}$	
Square		$A = s^2 = \text{side} \times \text{side}$	
Circle		$A = \pi r^2 = \pi \times \text{square of radius}$ $C = 2\pi r = 2 \times \pi \times \text{radius}$ $\pi \approx 3.14 \text{ or } \frac{22}{7}$	
Figure		Formulas for Volume (V) and Surface Area (SA)	
Rectangular Prism		$V = lwh = \text{length} \times \text{width} \times \text{height}$ $SA = 2lw + 2hw + 2lh$ $= 2(\text{length} \times \text{width}) + 2(\text{height} \times \text{width}) + 2(\text{length} \times \text{height})$	
General Prisms		$V = Bh = \text{area of base} \times \text{height}$ $SA = \text{sum of the areas of the faces}$	
Cylinder		$V = \pi r^2 h = \pi \times \text{square of radius} \times \text{height}$ $SA = 2\pi r^2 + 2\pi rh$ $= 2 \times \pi \times \text{square of radius} +$ $2 \times \pi \times \text{radius} \times \text{height}$	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Sphere		$V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times \text{cube of radius}$ $SA = 4\pi r^2 = 4 \times \pi \times \text{square of radius}$	
Right Circular Cone		$V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times \pi \times \text{square of radius} \times \text{height}$	
Regular Pyramid		$V = \frac{1}{3}Bh = \frac{1}{3} \times \text{area of base} \times \text{height}$	

## Equation of a Line

### Slope-Intercept Form:

$$y = mx + b$$

where  $m$  = slope and  $b$  =  $y$ -intercept

### Point-Slope Form:

$$y - y_1 = m(x - x_1)$$

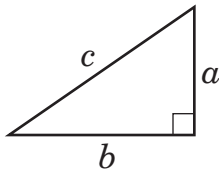
where  $m$  = slope and  $(x_1, y_1)$  is a point on a line

## Slope of a Line

Let  $(x_1, y_1)$  and  $(x_2, y_2)$  be two points in the plane.

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1} \text{ where } x_2 \neq x_1$$

## Pythagorean Theorem



$$a^2 + b^2 = c^2$$

## Distance Formula

$$d = rt$$

where  $d$  = distance,  $r$  = rate, and  $t$  = time

## Temperature Formulas

$$^{\circ}\text{C} = \frac{5}{9}(\text{F} - 32)$$

$$^{\circ}\text{Celsius} = \frac{5}{9} \times (^{\circ}\text{Fahrenheit} - 32)$$

$$^{\circ}\text{F} = \frac{9}{5}\text{C} + 32$$

$$^{\circ}\text{Fahrenheit} = \frac{9}{5} \times ^{\circ}\text{Celsius} + 32$$

## Simple Interest Formula

$$i = prt$$

where  $i$  = interest,  $p$  = principal,

$r$  = rate, and  $t$  = time

## Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

where  $ax^2 + bx + c = 0$ ,  $a \neq 0$ , and  $b^2 - 4ac \geq 0$

## Conversions

1 yard = 3 feet = 36 inches

1 mile = 1,760 yards = 5,280 feet

1 acre = 43,560 square feet

1 hour = 60 minutes

1 minute = 60 seconds

1 liter = 1000 milliliters = 1000 cubic centimeters

1 meter = 100 centimeters = 1000 millimeters

1 kilometer = 1000 meters

1 gram = 1000 milligrams

1 kilogram = 1000 grams

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

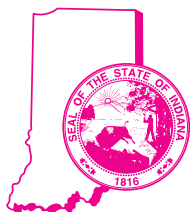
1 pound = 16 ounces

1 ton = 2,000 pounds

# Graduation Qualifying Exam Retest

## Applied Skills Assessment

### Mathematics



Indiana Department of Education